

Appl. No. 09/744,697

Amtd. dated February 17, 2004

Reply to Office action of November 17, 2003

REMARKS

Applicants respectfully request entry of this Amendment and reconsideration of this application, as amended.

Claims 1 to 23 and 25 are currently pending in this application. Claim 24 has been cancelled.

Rejections Under 35 USC 112

Claims 7-23 have been rejected under 35 USC 112, paragraph 5 as constituting multiple dependent claims which depend from other multiple dependent claims. Reconsideration is respectfully requested.

A Preliminary Amendment Under 37 CFR 1.121 was filed January 29, 2001 including a substitute specification to correct multiple dependent claims for better conformity with U.S. practice. Please confirm receipt of said substitute specification.

Claims 1-24 have been rejected under 35 USC 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which Applicants regard as the invention. Reconsideration is respectfully requested.

Thus with regard to reference in claim 1 to "elements necessary to form the phosphorus-containing molecular sieves", such elements are well known in the art including sources of aluminum and phosphorus and an organic template. Processes for the manufacture of silicoaluminophosphates employ sources of silicon, aluminum, phosphorus and an organic template. Applicants have, however, in the interests of advancing prosecution, amended claim 1 to include sources of aluminum, phosphorus, and an organic template. Support for the amendment can be found on page 1 of the instant application.

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Applicants disagree with the Examiner that the phrase "for a time and a temperature appropriate to form the desired molecular sieve" is indefinite. Appropriate treatment times and temperatures are described on page 4 of the instant specification. Applicants are not required to recite all reaction parameters. However, the term "appropriate" has been changed to "sufficient" in order to better conform to U.S. practice.

The term "wherein the seeds are of structure type" as used in the present specification is clearly described on page 2 of the instant specification and is therefore not indefinite. An extract of The Structure Type Atlas, Zeolites 17, 1996 is being provided for the Examiner's convenience.

Claim 23 has been amended to positively recite "contacting the hydrocarbons." Claim 24 has been cancelled and new claim 25 has been added in order to recite "positive steps."

Rejection Under 35 USC 101

Claims 23 and 24 have been rejected under 35 U.S.C. 101 because the claimed recitation of a use without setting forth any steps involved in the process, results in the improper definition of the process. Reconsideration is respectfully requested.

Claim 23 has been amended to positively recite "contacting the hydrocarbons." Claim 24 has been cancelled and new claim 25 has been added in order to recite "steps."

Rejection Under 35 USC 102/103

Claims 19-23 have been rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as obvious over U.S. Patent No. 4,440,871 to Lok et al. (Lok). Reconsideration is respectfully requested.

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Lok teaches crystalline microporous silicoaluminophosphates (SAPOs) synthesized by hydrothermal crystallization of silicoaluminophosphate gels containing a molecular structure forming templating agent. In synthesizing the SAPO compositions of Lok, it is preferred that the reaction mixture be essentially free of alkali metal cations (column 4, lines 51-53). In general, seeding the reaction mixture with seed crystals of either the SAPO species to be produced or a topologically similar aluminophosphate or aluminosilicate, facilitates the crystallization procedure (column 8, lines 10-16).

No further teaching of the use of seed crystals, let alone the use of colloidal molecular sieve seeds, as recited in Applicants' independent claim 1, can be found anywhere in Lok. Thus, the reference lacks the positive recitation required of an anticipating reference as required under 35 USC 102(b).

The Examiner relies on Example 32 of Lok to teach the claimed crystalline molecular sieve containing phosphorus in its framework and the claimed SAPO-34. The composition of the final reaction mixture in of Example 32 of Lok is not the same as the molar composition of the synthesis mixture for producing SAPO-34, as discussed on pages 8 and 9 of the instant specification. In fact, the product of Example 32 is impure. Furthermore, instant claim 1, from which claim 19 depends, recites the use of colloidal crystalline molecular sieve seeds. Example 32 of Lok does not employ seeds, let alone colloidal crystalline molecular sieve seeds. Therefore, the product of Example 32 of Lok is not made in substantially the same manner as disclosed in both instant claim 1 and Applicants' specification.

Rejection Under 35 USC 103

Claims 1-18 and 24 have been rejected under 35 USC 103(a) as being obvious over U.S. Patent No. 4,440,871 to Lok et al. (Lok) in view of either European Patent EP0753484 (the '484 patent) or European Patent EP0753485 (the '485 patent). Reconsideration is respectfully requested.

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Lok teaches crystalline microporous silicoaluminophosphates (SAPOs) synthesized by hydrothermal crystallization of silicoaluminophosphate gels containing a molecular structure forming templating agent. In synthesizing the SAPO compositions of Lok, it is preferred that the reaction mixture be essentially free of alkali metal cations (column 4, lines 51-53). In general, seeding the reaction mixture with seed crystals of either the SAPO species to be produced or a topologically similar aluminophosphate or aluminosilicate, facilitates the crystallization procedure (column 8, lines 10-16).

No further teaching of the use of seed crystals, let alone the use colloidal molecular sieve seeds, as recited in Applicants' claim 1 and new claim 25, can be found anywhere in Lok. There is also no disclosure that the addition of seed crystals controls the particle size of the product and/or the acceleration of the formation of the product, as recited in new claim 25.

The '484 patent and the '485 patent are relied on to overcome the deficiencies of the primary reference, Lok. The '484 patent discloses the use of colloidal zeolite seed crystals as structure directing agents in the thermal treatment of a zeolite synthesis mixture. No organic structure directing agent, such as tetrapropylammonium hydroxide (TPAOH), is used. The zeolite seeds are of the same structure type as that of the desired molecular sieve and the synthesis mixture contains alkali metal cations, advantageously sodium or potassium.

The '485 patent discloses a process for the manufacture of a zeolite which comprises the thermal treatment of a zeolite synthesis mixture containing zeolite seed crystals of particle size at most 100 nm to accelerate zeolite crystallization. A proportion of seeds, based on the weight of the synthesis mixture of at most 0.1 wt.%, is used. Again the synthesis mixture contains alkali metal cations.

Lok and the '484 patent and/or the '485 patent are not properly combinable. Reaction mixture chemistry in the synthesis of crystalline materials is very important. A single directing agent might lead crystallization to multiple structures and a single structure may be directed by

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different directing agents. Lok employs an organic structure directing agent in addition to seed crystals, whereas the '484 patent employs only seed crystals to avoid the need for the structure directing agent.

In addition, different reaction components have a substantial effect on the crystallization of molecular sieves. In synthesizing phosphorus containing molecular sieves, such as aluminophosphates or silicoaluminophosphates, it is important that the reaction mixture be essentially free of alkali metal cations. This is discussed at length in Lok where, for example, it is stated that the presence of alkali metal cations and the concomitant high pH "results in a marked tendency to produce extraneous aluminophosphates which appear to be dense, i.e., non-microporous, compositions" (see Lok at column 6, lines 30-37). In contrast, in the synthesis of zeolites, such as disclosed in both the '484 patent and the '485 patent, alkali metal ions, advantageously sodium or potassium ions, are present and the synthesis is conducted under alkaline conditions.

Moreover, Applicants respectfully submit that the combination of Lok and the '484 patent or the '485 patent for purposes of the present rejection is improper because of the failure of either patent to suggest the combination. It is a requirement that in making a combination of patents in a rejection, those patents must suggest the desirability of the combination of teachings. This requirement was expressed by the Court of Customs and Patent Appeals in *In re Imperato*, 179 U.S.P.Q. 73, where it states "...the mere fact that those disclosures can be combined does not make the combination obvious unless the art also contains something to suggest the desirability of the combination." Since the cited references are devoid of any teaching as to the desirability of the combination, it is submitted that the rejection based on the combination is therefore untenable. Therefore, without a teaching or suggestion that the desirability of the combination, the rejection could only have been made upon a hindsight reconstruction from the teachings of Applicants' own disclosure.

It is well settled that the question of obviousness must be approached without recourse to

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the teachings of Applicants' specification. It is respectfully submitted that without recourse to that teaching of the present specification, the problems solved by the present invention and any technique capable of solving them were not contemplated by the applied references and it is not reasonable to conclude that from such a failure the invention was obvious at the time it was made to a person of ordinary skill in the art. This is specifically discussed in *In re Sponnable*, 160 U.S.P.Q. 237, at page 243, where it stated:

"The court must be ever alert not to read obviousness into an invention on the basis of Applicants' own statements, that is we must view the prior art without reading into the art Applicants teachings."

It is therefore respectfully submitted that claim 1 is patentably distinguished from Lok, the '484 patent and the '485 patent.

In addition, there is no specific disclosure in either the '484 patent or the '485 patent of producing a phosphorus-containing molecular sieve "selected from aluminophosphates or silicoaluminophosphates," as recited in instant claim 2. There is no specific disclosure in either the '484 patent or the '485 patent of the CHA or LEV structure type, as recited in instant claim 3. There is no specific disclosure in either the '484 patent or the '485 patent of SAPO-34, as recited in instant claims 4 and 5.

There is no disclosure in either the '484 patent or the '485 patent of Broensted acid sites, let alone the percentage area contribution of Broensted acid sites, as recited in instant claims 6 and 7. It is believed that Broensted acidity is important in the catalytic activity of a molecular sieve and that a molecular sieve in which the bridged hydroxyl groups represent a high proportion of the hydroxyl groups in the crystal will have high activity.

Given the foregoing shortcomings of Lok, the '484 patent and the '485 patent, it is respectfully submitted that they fail to disclose or suggest the invention of claims 1-23 and 25. Accordingly, withdrawal of the rejections under 35 USC 101, 112, 102 (b) and 103 (a) is

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respectfully requested. Applicants therefore respectfully request that a timely Notice of Allowance be issued in this case.

Any comments or questions concerning the application can be directed to the undersigned at the telephone number given below.

Respectfully submitted,

Feb. 17, 2004
Date

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